

$K_{\pi 2}$ Branching Ratio.

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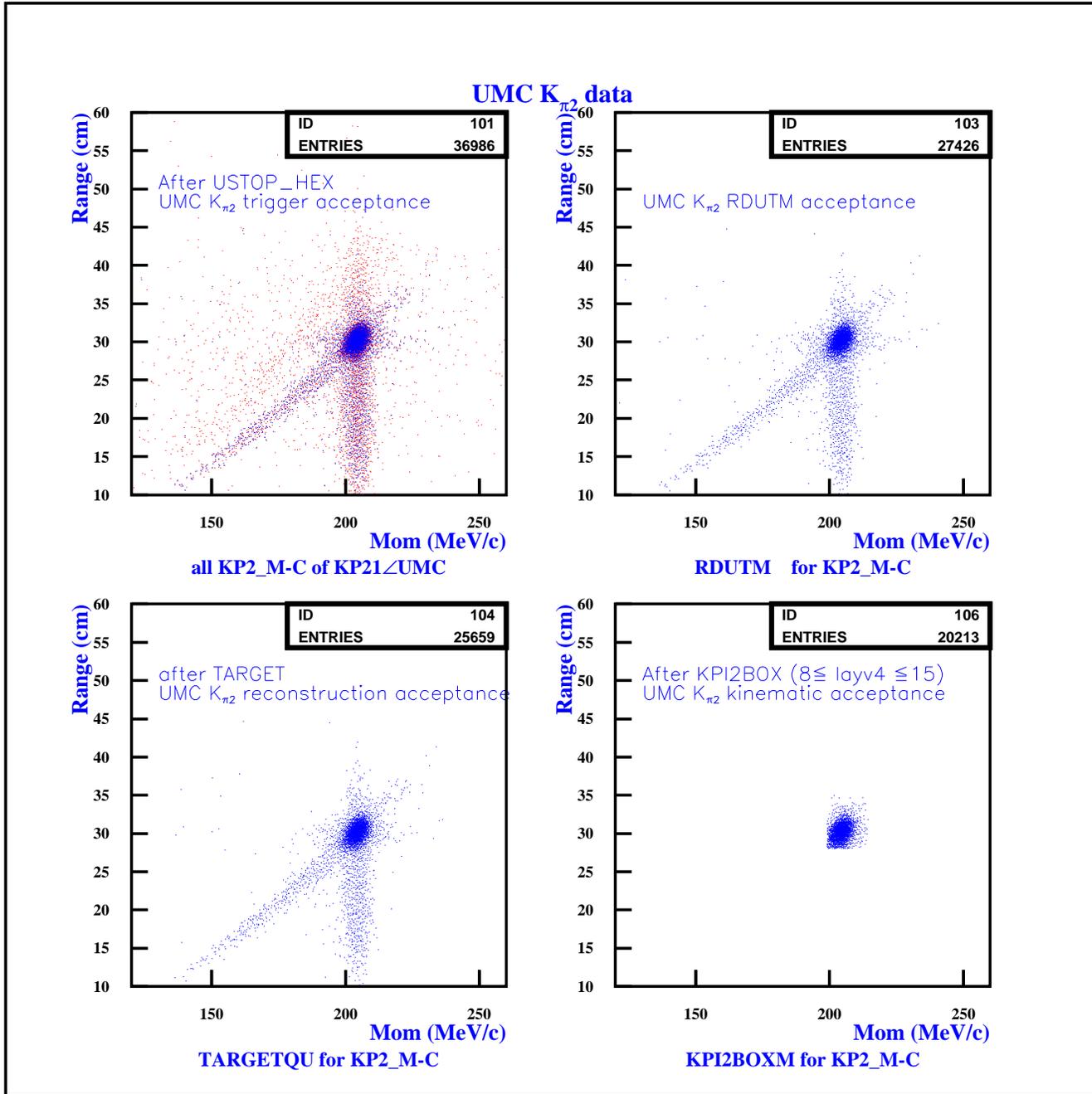


Figure 1: The $K_{\pi 2}$ events range vs momentum. UMC data.

The KP2 events after cuts are shown in blue colour.

Cut	2002 (acc.)	2007 (acc.)
KT	49997	99993
T•A	22697(0.45397)	44891(0.44894)
Reach Layer B	19090(0.84108)	37605(0.83769)
19ct-bar	18797(0.98465)	36986(0.98354)
UFATE	15910(0.84641)	31222(0.84416)
USTMED	15568(0.97850)	30518(0.97745)
USTOPHEX	13909(0.89344)	27426(0.89868)
$A_{K_{\pi 2}}^{UMC, trig}$	0.27820 \pm 0.00200	0.27428 \pm 0.00141
RDUTM	13909(1.00000)	27426(1.00000)
UTCQUAL	13489(0.96980)	26910(0.98119)
TARGET+TGQUAL	13348(0.98955)	25659(0.95351)
$A_{K_{\pi 2}}^{UMC, recon}$	0.95967 \pm 0.00167	0.93557 \pm 0.00148
KPI2STOP	12831(0.96127)	24639(0.96025)
COS3D	12305(0.95901)	23671(0.96071)
KPI2BOX_MOD	11225(0.91223)	20213(0.85391)
$A_{K_{\pi 2}}^{UMC, kin}$	0.84095 \pm 0.00317	0.78775 \pm 0.00255
$A_{K_{\pi 2}}^{UMC}$	0.22451 \pm 0.00187	0.20214 \pm 0.00127
KPI2BOX_PASS1	-----	22847(0.92352)
KPI2BOX_SM	-----	21942(0.88694)

Table 1: UMC $K_{\pi 2}$ acceptance of cuts applied in the $K_{\pi 2}$ branching ratio analysis. NIDIF is on. In E949, the $(\overline{19_{ct}} + \overline{20_{ct}} + \overline{21_{ct}})$ trigger condition has been changed to $\overline{19_{ct}}$.

$$(ONLINE\ TRIGGER)_{K_{\pi 2}} = KB \times T \cdot 2 \times (6_{ct} + 7_{ct}) \times \overline{19_{ct}} \quad (1)$$

UMC cut definitions

- **T•A** \equiv **T•2** Requirement is `ext(8) \equiv TRUE`?. Really one is applied in UMC codes.
- **Reach layer B** The inner nine layers of 19 mm thick counters were ganged together into 3 superlayers referred as the A, B and C having 4, 3 and 2 layers of scintillator, respectively. [2] Requirement is `layv4 \geq 6`. Really by Zhe Wang this requirement is $(6_{ct} + 7_{ct})$. I believe it \equiv `lct(6).and.lct(7)=.true.` in ntuple.
- $\overline{19_{ct}}$ μ -veto (see for detail in [3] p.207).
- **UFATE**^a requires that the pion stopped without decaying or interacting, this is why it has no acceptance loss for the NIDIF-off case.
- **USTMED** requires that the pion stopped in the RS scintillator.
- **USTOP_HEX** The offline reconstructed stopping counter agrees with the real one.
- **UTC/RANGE** The track reconstructed in UTC matches with those reconstructed in Range Stack and Target [1]
- **UTCQUAL** The UTCQUAL cuts require a track with a minimum of four z position measurements in UTC. A second requirement is a minimum value of 10^{-5} for the likelihood function constructed from the number of used xy hits, the number of UTC layers and the number of unused xy hits in each super layer (see for detail in [3] p.71).
- **TARGET** is SWATH CCD reconstruction cut.
`TARGET \equiv ITGQUAL \geq 2` in PNN1 and `ITGQUAL \geq 9` in PNN2.
- **KP2STOP** requires the stopping layer to be between layers 8 and 15 inclusive.
- **COS3D** Cut any event with a dip angle outside the effective detection region $-0.5 < \cos 3d < 0.5$.
- **KPI2BOX** is a 3σ cut on the $K_{\pi 2}$ range, energy and momentum.

^a**UFATE, USTMED and USTOP_HEX** [5] are cuts based on UMC truth variables.

Loose cut to remove kmu2 events and duplication event (by Shaomin Chen)

1). $rngmom_new3(0.) \ .LE. \ 3 \ .AND. \ .not.cut(6)$

2). $tlay \leq 21$

3). $ptot.NE.0.and.PTOT.NE.300$

4). B4EKZ cut have been changed in respect to k034 analyses cuts:

$dummy = beam_like(0.)$

* $if(dummy.le.2.0) \ return \ ! \ e949_pnn1 \ value$

$if(abs(dummy).lt.10.0) \ return \ ! \ TN391 \ value$

* $if(abs(dummy).le.10.0) \ return \ ! \ value \ from \ Bipul's \ code$

$if(ictpi.eq.1) \ then$

* $if(dummy.le.12.5) \ return \ ! \ e949_pnn1 \ value$

$if(abs(dummy).lt.20.0) \ return \ ! \ TN391 \ value$

* $if(abs(dummy).le.20.0) \ return \ ! \ value \ from \ Bipul's \ code$

$endif$

I applied the old one and came up with acceptance 0.96313 (0.96302 in k034).

TGQUALT added to TARGET.

Shaomin Chen used KPI2BOX:

$KP2BOX = abs(rdev).LT.3.AND.abs(edev).LT.3.AND.abs(pdev).LT.3$

KPI2BOX_MOD used now is:

$$199. < ptot < 215. \quad (2)$$

$$28. < rtot < 35. \quad (3)$$

$$100.5 < etot < 115. \quad (4)$$

KPI2BOX used in E787 [1] is:

$$199.53 < ptot < 211.67 \quad (5)$$

$$28.02 < rtot < 35.42 \quad (6)$$

$$100.45 < etot < 115.75 \quad (7)$$

Cut name	Acc2002-Acc2007	$N_{K_{\pi 21}}$ (Acc) 2002	$N_{K_{\pi 21}}$ (Acc) 2007	$N_{K_{\pi 21}} \times Prescale$ (Acc) 2007
	ALL	81214	724902	9.36294E+10
	BAD_RUN 1.426%	81214(1.00000)	714568(0.98574)	9.24634E+10(0.98755)
	TRIGGER 0.000%	81214(1.00000)	714568(1.00000)	9.24634E+10(1.00000)
	BAD_STR -0.023%	80802(0.99493)	711106(0.99516)	9.20117E+10(0.99511)
	RD_TRK 0.000%	80802(1.00000)	711106(1.00000)	9.20117E+10(1.00000)
	TRKTIM 0.000%	80802(1.00000)	711106(1.00000)	9.20117E+10(1.00000)
	RDUTM 0.001%	80802(1.00000)	711102(0.99999)	9.20111E+10(0.99999)
	UTCQUAL 0.065%	70119(0.86779)	616625(0.86714)	7.97768E+10(0.86704)
	TARGET+TGQUALT 5.011%	67908(0.96847)	566280(0.91835)	7.32631E+10(0.91835)
	COS3D 0.886%	64911(0.95587)	536269(0.94700)	6.93759E+10(0.94694)
	B4DEDX 0.535%	63298(0.97515)	520074(0.96980)	6.72774E+10(0.96975)
	CPITRS 0.431%	62406(0.98591)	510501(0.98159)	6.60412E+10(0.98162)
	CPITAIL 0.003%	62352(0.99913)	510045(0.99911)	6.59829E+10(0.99912)
	ICBIT 0.008%	62328(0.99962)	509809(0.99954)	6.59520E+10(0.99953)
	TIC -0.516%	61766(0.99098)	507843(0.99614)	6.56971E+10(0.99613)
	TIMCON 0.184%	61285(0.99221)	502956(0.99038)	6.50619E+10(0.99033)
	TGTCON 1.436%	61285(1.00000)	495735(0.98564)	6.41302E+10(0.98568)
	DCBIT -0.303%	52030(0.84898)	422371(0.85201)	5.46527E+10(0.85221)
	DEL -0.544%	44934(0.86362)	367064(0.86906)	4.74790E+10(0.86874)
	CKTRS 0.072%	43547(0.96913)	355468(0.96841)	4.59838E+10(0.96851)
	CKTAIL -0.033%	42268(0.97063)	345145(0.97096)	4.46428E+10(0.97084)
	BWTRS -0.025%	39879(0.94348)	325722(0.94373)	4.21305E+10(0.94372)
	RVUPV 0.304%	39114(0.98082)	318482(0.97777)	4.11911E+10(0.97770)
	TARGF 0.238%	37126(0.94917)	301536(0.94679)	3.90004E+10(0.94682)
	DTGTP -0.024%	37116(0.99973)	301526(0.99997)	3.89991E+10(0.99997)
	RTDIF -0.118%	36697(0.98871)	298479(0.98989)	3.86052E+10(0.98990)
	TGQUALT 0.000%	36697(1.00000)	298479(1.00000)	3.86052E+10(1.00000)
	PIGAP 0.150%	36298(0.98913)	294785(0.98762)	3.81282E+10(0.98764)
	TGB4 1.119%	34123(0.94008)	273824(0.92889)	3.54202E+10(0.92898)
	KIC -0.120%	33611(0.98499)	270044(0.98620)	3.49307E+10(0.98618)
	TGCEO 0.027%	27745(0.82547)	222841(0.82520)	2.88304E+10(0.82536)
	B4EKZ 4.258%	26719(0.96302)	205112(0.92044)	2.65363E+10(0.92043)
	B4ETCON 0.444%	26719(1.00000)	204201(0.99556)	2.64166E+10(0.99549)
	TGZFOOL 1.264%	26719(1.00000)	201620(0.98736)	2.60825E+10(0.98735)
	PV_noBV 0.000%	26719(1.00000)	201620(1.00000)	2.60825E+10(1.00000)
	IPIFLG 2.073%	19321(0.72312)	141616(0.70239)	1.83141E+10(0.70216)
	KPI2BOXM 4.632%	17037(0.88179)	118316(0.83547)	1.52985E+10(0.83534)
	KP2STOP -0.087%	16972(0.99618)	117968(0.99706)	1.52534E+10(0.99705)
	RTOT40 0.000%	16972(1.00000)	117968(1.00000)	1.52534E+10(1.00000)
	$N_{K_{\pi 2}}$	16972	117968	1.52534E+10

Table 2: For the $K_{\pi 2}$, cuts applied in the $K_{\pi 2}$ BR analysis.

$$\overline{Prescaler} K_{\pi 2} = \frac{9.24634E+10}{714568} \sim 129398$$

$$(KB_{live})_{K_{\pi 2}} = 1.481 \times 10^{12}$$

Cut name	Acc2002-Acc2007	$N_{K_{\pi 21}}$ (Acc) 2002	$N_{K_{\pi 21}}$ (Acc) 2007	$N_{K_{\pi 21}} \times Prescale$ (Acc) 2007
<i>SETUP</i> <i>PRD</i>	5.299%	49651(0.61136)	404765(0.55837)	5.22487E+10(0.55804)
<i>RD</i> <i>TRK</i>	0.000%	49651(1.00000)	404765(1.00000)	5.22487E+10(1.00000)
<i>TRK</i> <i>TIM</i>	0.000%	49651(1.00000)	404765(1.00000)	5.22487E+10(1.00000)
<i>A</i> <i>_RD,Br</i>	0.000%	1.00000 ± 0.00000	1.00000 ± 0.00000	1.00000 ± 0.00000
<i>SETUP</i> <i>PRECON</i>	-12.116%	32370(0.39058)	370964(0.51174)	4.78959E+10(0.51155)
<i>RD</i> <i>UTM</i>	0.000%	32370(1.00000)	370963(1.00000)	4.78958E+10(1.00000)
<i>UTC</i> <i>QUAL</i>	0.112%	29370(0.90732)	336169(0.90621)	4.33994E+10(0.90612)
<i>TARGET+TG</i> <i>QUALT</i>	4.105%	29063(0.98955)	318856(0.94850)	4.11659E+10(0.94854)
<i>A</i> <i>_RECO,Br</i>	3.830%	0.89784 ± 0.00168	0.85953 ± 0.00057	0.85949 ± 0.00000
<i>SETUP</i> <i>PREST</i>	2.185%	32875(0.40480)	277600(0.38295)	3.58556E+10(0.38295)
<i>TIC</i>	-8.535%	32789(0.91398)	277413(0.99933)	3.58316E+10(0.99933)
<i>TIM</i> <i>CON</i>	-0.016%	32657(0.99597)	276340(0.99613)	3.56891E+10(0.99602)
<i>TGT</i> <i>CON</i>	1.169%	32657(1.00000)	273110(0.98831)	3.52697E+10(0.98825)
<i>DC</i> <i>BIT</i>	-0.245%	28892(0.88471)	242292(0.88716)	3.12928E+10(0.88724)
<i>DEL</i> <i>C</i>	-0.467%	25149(0.87045)	212035(0.87512)	2.73688E+10(0.87460)
<i>CK</i> <i>TRS</i>	-0.053%	24469(0.97296)	206415(0.97349)	2.66445E+10(0.97354)
<i>CK</i> <i>TAIL</i>	-0.054%	23767(0.97131)	200605(0.97185)	2.58887E+10(0.97163)
<i>B4</i> <i>DEDX</i>	-0.122%	23357(0.98275)	197389(0.98397)	2.54739E+10(0.98398)
<i>CP</i> <i>ITRS</i>	0.020%	23130(0.99028)	195431(0.99008)	2.52206E+10(0.99006)
<i>CP</i> <i>ITAIL</i>	0.031%	23119(0.99952)	195277(0.99921)	2.52007E+10(0.99921)
<i>TARG</i> <i>F</i>	-0.160%	22120(0.95679)	187152(0.95839)	2.41504E+10(0.95832)
<i>DTG</i> <i>TTP</i>	-0.025%	22114(0.99973)	187148(0.99998)	2.41498E+10(0.99997)
<i>RT</i> <i>DIF</i>	0.053%	21917(0.99109)	185382(0.99056)	2.39227E+10(0.99060)
<i>TG</i> <i>QUALT</i>	0.000%	21917(1.00000)	185382(1.00000)	2.39227E+10(1.00000)
<i>PIG</i> <i>AP</i>	0.173%	21731(0.99151)	183487(0.98978)	2.36782E+10(0.98978)
<i>TGB</i> <i>4</i>	1.326%	20560(0.94611)	171166(0.93285)	2.20886E+10(0.93287)
<i>KIC</i>	0.599%	20409(0.99266)	168883(0.98666)	2.17939E+10(0.98666)
<i>TG</i> <i>GEO</i>	-0.663%	16788(0.82258)	140040(0.82921)	1.80743E+10(0.82933)
<i>B4</i> <i>EKZ</i>	4.092%	16240(0.96736)	129738(0.92644)	1.67394E+10(0.92614)
<i>B4</i> <i>ETCON</i>	0.427%	16240(1.00000)	129184(0.99573)	1.66680E+10(0.99574)
<i>TG</i> <i>ZFOOL</i>	1.288%	16240(1.00000)	127520(0.98712)	1.64534E+10(0.98713)
<i>BW</i> <i>TRS</i>	-0.213%	15503(0.95462)	122005(0.95675)	1.57441E+10(0.95689)
<i>RV</i> <i>UPV</i>	0.353%	15278(0.98549)	119803(0.98195)	1.54605E+10(0.98199)
<i>A</i> <i>_REST,Br</i>	3.316%	0.46473 ± 0.00275	0.43157 ± 0.00094	0.43119 ± 0.00000
loose <i>A</i> <i>_IPIFLG</i>	1.100%	0.8350 ± 0.0054	0.82400 ± 0.00120	
tight <i>A</i> <i>_IPIFLG</i>	0.800%		0.82700 ± 0.00120	0.82700 ± 0.00120
A_{μ}^{acc}	0.000%	0.9931 ± 0.0002	0.9931 ± 0.0002	0.9931 ± 0.0002
is loss due to <i>19ct-bar</i>				
tight <i>IPIFLG</i> <i>A</i> <i>K_{\pi 2,Br}</i>	4.140%	0.3460 ± 0.0031	0.3046 ± 0.0035	0.3044 ± 0.0000

Table 3: $K_{\pi 2}$ -based acceptances of cuts applied in the $K_{\pi 2}$ BR analysis. The IPIFLG acceptance is measured using π_{scat} 's (counting method) similar to the $\pi\nu\bar{\nu}$ measurement of IPIFLG acceptance, except that here the π_{scat} 's are selected using KP2BOX and KP2STOP instead of BOX and LAYV4. The SETUP cuts are defined in Table 4. (similar to Table 69 on page 217 tn-k034)

$$\epsilon T \cdot 2 \cdot IC(K_{\pi 2}) = 0.9302 \pm 0.0025 \text{ Table 64 on page 212 [3]}$$

$$(KB_{live})_{K_{\pi 2}} = 1.76 \times 10^{12} \text{ Table 64 on page 199 [3]}$$

$$BR(K_{\pi_2}) = \frac{N_{K_{\pi_2}}}{\epsilon T \cdot 2 \cdot IC(K_{\pi_2}) \cdot (KB_{live})_{K_{\pi_2}} \cdot A_{K_{\pi_2, Br}} \cdot A_{K_{\pi_2, kin}}^{UMC} \cdot f_S \cdot A_{K_{\pi_2, trig}}^{UMC}} \quad (8)$$

$$= 0.215 \pm 0.005_{stat} \quad (9)$$

- $N_{K_{\pi_2}} = 16972$ Table 2 (Tab. 62 on p. 209 in k034).

$$(117968 \text{ or } \sum_{i=1}^{N_{runs}} (\text{Nuber of Events})_i \cdot \text{Prescale}_i = 152534 \times 10^5 \text{ now})$$

- $\epsilon T \cdot 2 \cdot IC(K_{\pi_2}) = 0.9302 \pm 0.0025$. Table 64 on p. 212 in k034.
- $(KB_{live})_{K_{\pi_2}} = 1.76 \times 10^{12} (1.481 \times 10^{12} \text{ now})$. Table 56 on p. 199 in k034.
- $A_{K_{\pi_2, Br}} = 0.3460 \pm 0.0031$. (0.3044 \pm 0.0035 now). Table 7 (69 on p. 217 in k034).
- $A_{K_{\pi_2, kin}}^{UMC} = 0.84095 \pm 0.00317$ (0.78775 \pm 0.00255 now) Table 1 (66 on p. 214 in k034).
- $f_S = 0.8098 \pm 0.0011$
Table 70 on p. 219 in k034. (0.7740 \pm 0.0011 [4] p.40 and see also [5], Table 6.11 on p.127 and p.77)
- $A_{K_{\pi_2, trig}}^{UMC} = 0.27820 \pm 0.0020$ (0.27428 \pm 0.00141 now) Table 1 (66 on p. 214 in k034).
- **Prescale online** = 131072-163840
Table 56 on p. 199 in k034. (See also tn k025 and Table 5).
- **Prescale offline** = 10 Table 56 on p. 199 in k034.

$$\frac{BR(K_{\pi_2})}{\text{Prescale}} = \frac{16972}{0.9302 \cdot 1.76 \times 10^{12} \cdot 0.3460 \cdot 0.84095 \cdot 0.8098 \cdot 0.27820} \quad (10)$$

$$= \frac{16972}{0.1073174 \times 10^7} = 1.58147688 \times 10^{-7} \quad (11)$$

$$\text{Prescale} = \frac{0.215}{1.1807 \times 10^{-7}} = 135948.8 \times 10 \quad (12)$$

$$BR(K_{\pi_2}) = \frac{152534 \times 10^5}{0.9302 \cdot 1.481 \times 10^{12} \cdot 0.3044 \cdot 0.78775 \cdot 0.8098 \cdot 0.27428} \quad (13)$$

$$= 0.208 \pm 0.005 \quad (14)$$

in good agreement with PDG2007 [6] value 0.2092 ± 0.0012

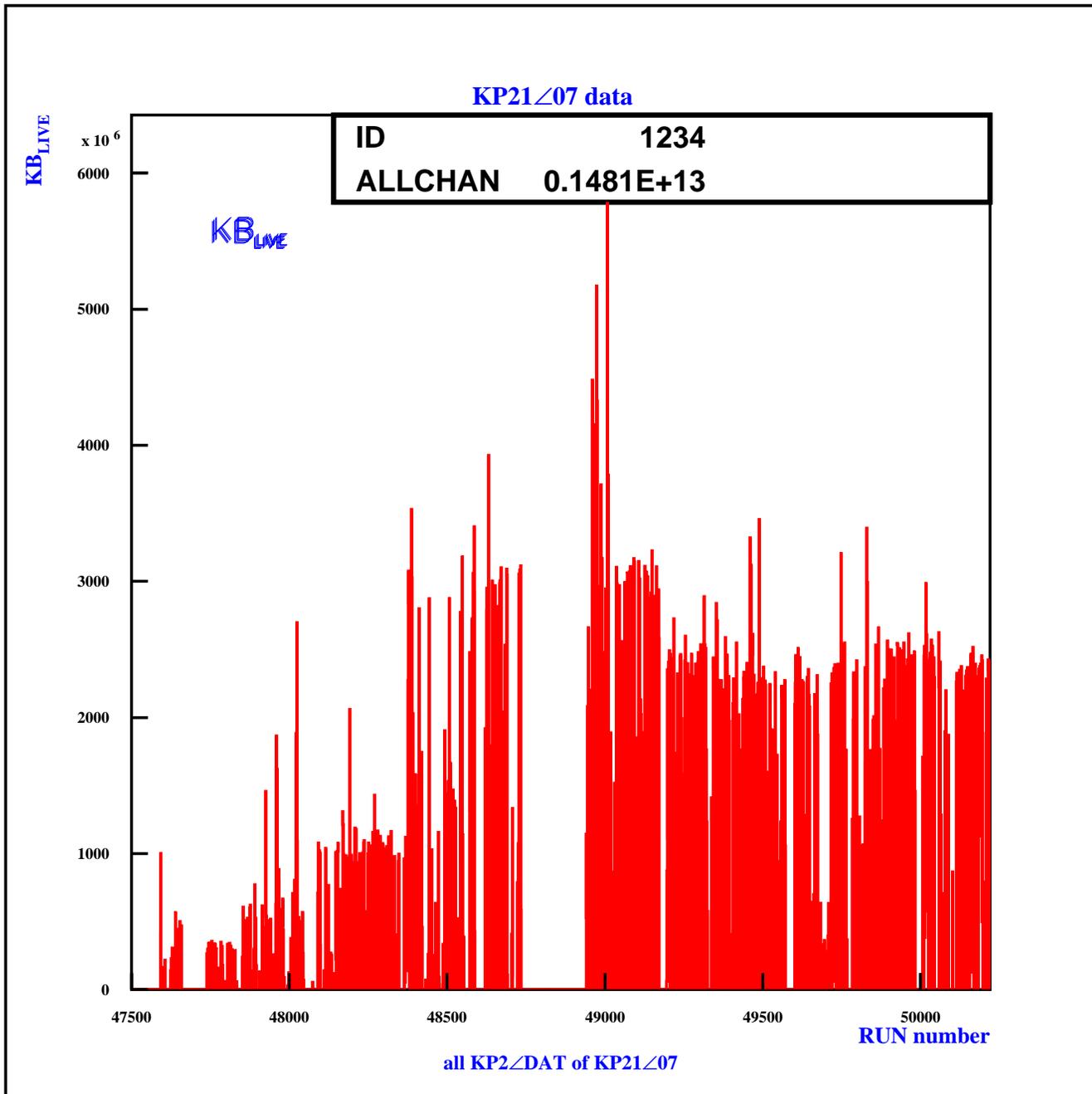


Figure 2: The KB_{LIVE} vs run number.

Some runs don't have the EOS ntuples and were rejected.
 The rarek13 and rarek18 hosts are unreachable.

$$(KB_{live})_{K\pi_2} = 1.481 \times 10^{12}$$

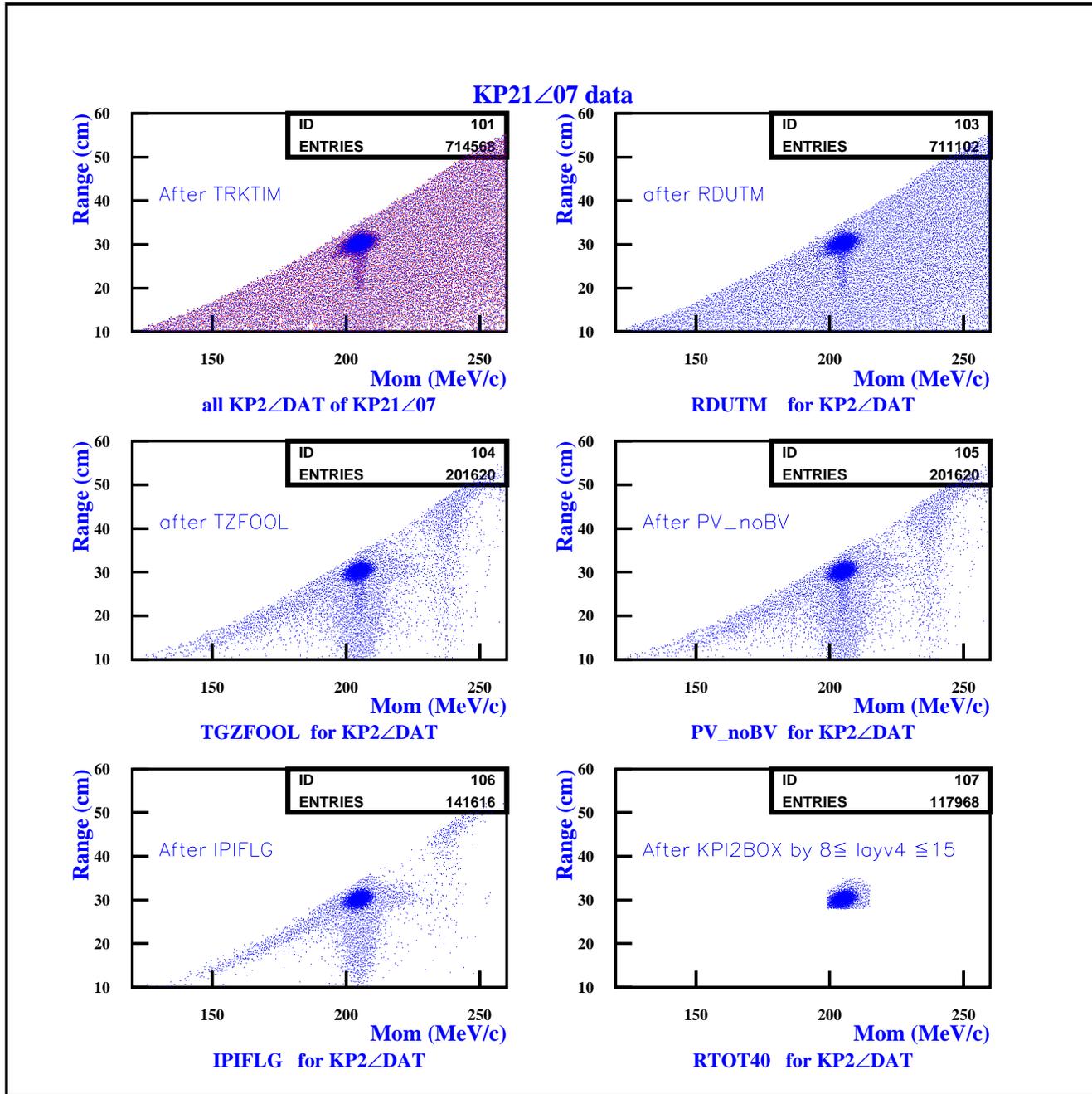


Figure 3: The $K_{\pi 2}$ events range vs momentum. $K_{\pi 2}(1)$ Monitoring data

The KP2 events after cuts are shown in blue colour.

$K_{\pi 2}$ SETUP	component cuts
$SETUP_{RD}$	TRIGGER, ICBIT, $t_{IC} - t_{Ck} > 5 \text{ ns}^a$, B4DEDX, UTC, TARGET
$SETUP_{recon}$	TRIGGER, ICBIT, $t_{IC} - t_{Ck} > 5 \text{ ns}$, B4DEDX, CPITRS, CPITAIL, CKTRS, CKTAIL, BWTRS, RVUPV, A_{RD} cuts,
$SETUP_{rest}$	TRIGGER, ICBIT, A_{RD} cuts, A_{recon} cuts, KP2BOX, KP2STOP, IPIFLG, COS3D.

Table 4: Setup cuts used in the $K_{\pi 2}$ -based acceptance measurement and used in $K_{\pi 2}$ BR analysis. (Table 58 on page 201 tn-k034)

Blue color cut names have been upgraded (updated or even added) on Table 7

N	Number of runs	Prescale	Comment
1	1331	131072	
2	251	163840	
3	18	16384	
4	8	2097152	
5	1109	0	BAD_RUN
6	15	400	
7	13	800	
8	1	1	
9	1	200	
10	1	16	
11	2	256	

Table 5: Prescale values used for the $K_{\pi 2}$ events in 2007 run of data taking.

Cut name	Acc2002-Acc2007	$N_{K_{\pi 21}}$ (Acc) 2002	$N_{K_{\pi 21}}$ (Acc) 2007	$N_{K_{\pi 21}} \times Prescale$ (Acc) 2007
	ALL	81214	708068	9.34289E+10
	BAD_RUN 1.081%	81214(1.00000)	700417(0.98920)	9.22960E+10(0.98787)
	TRIGGER 0.000%	81214(1.00000)	700417(1.00000)	9.22960E+10(1.00000)
	BAD_STR -0.028%	80802(0.99493)	697058(0.99520)	9.18442E+10(0.99511)
	RD_TRK 0.000%	80802(1.00000)	697058(1.00000)	9.18442E+10(1.00000)
	TRKTIM 0.000%	80802(1.00000)	697058(1.00000)	9.18442E+10(1.00000)
	RDUTM 0.001%	80802(1.00000)	697054(0.99999)	9.18436E+10(0.99999)
	UTCQUAL 0.069%	70119(0.86779)	604416(0.86710)	7.96348E+10(0.86707)
	TARGET+TGQUALT 5.011%	67908(0.96847)	555069(0.91836)	7.31359E+10(0.91839)
	COS3D 0.890%	64911(0.95587)	525632(0.94697)	6.92552E+10(0.94694)
	B4DEDX 0.534%	63298(0.97515)	509763(0.96981)	6.71651E+10(0.96982)
	CPITRS 0.430%	62406(0.98591)	500386(0.98160)	6.59311E+10(0.98163)
	CPITAIL 0.002%	62352(0.99913)	499943(0.99911)	6.58728E+10(0.99912)
	ICBIT 0.009%	62328(0.99962)	499708(0.99953)	6.58419E+10(0.99953)
	TIC -0.515%	61766(0.99098)	497776(0.99613)	6.55869E+10(0.99613)
	TIMCON 0.184%	61285(0.99221)	492985(0.99038)	6.49560E+10(0.99038)
	TGTCON 1.435%	61285(1.00000)	485911(0.98565)	6.40242E+10(0.98565)
	DCBIT -0.295%	52030(0.84898)	413966(0.85194)	5.45574E+10(0.85214)
	DELCD -0.531%	44934(0.86362)	359708(0.86893)	4.73964E+10(0.86874)
	CKTRS 0.068%	43547(0.96913)	348359(0.96845)	4.59013E+10(0.96845)
	CKTAIL -0.027%	42268(0.97063)	338220(0.97089)	4.45645E+10(0.97088)
	BWTRS -0.029%	39879(0.94348)	319202(0.94377)	4.20585E+10(0.94377)
	RVUPV 0.307%	39114(0.98082)	312098(0.97774)	4.11213E+10(0.97772)
	TARGF 0.232%	37126(0.94917)	295511(0.94685)	3.89368E+10(0.94688)
	DTGTP -0.024%	37116(0.99973)	295501(0.99997)	3.89355E+10(0.99997)
	RTDIF -0.118%	36697(0.98871)	292513(0.98989)	3.85417E+10(0.98989)
	TGQUALT 0.000%	36697(1.00000)	292513(1.00000)	3.85417E+10(1.00000)
	PIGAP 0.151%	36298(0.98913)	288890(0.98761)	3.80647E+10(0.98762)
	TGB4 1.124%	34123(0.94008)	268332(0.92884)	3.53588E+10(0.92891)
	KIC -0.116%	33611(0.98499)	264617(0.98616)	3.48693E+10(0.98616)
	TGCEO 0.021%	27745(0.82547)	218378(0.82526)	2.87774E+10(0.82529)
	B4EKZ 4.261%	26719(0.96302)	200997(0.92041)	2.64876E+10(0.92043)
	B4ETCON 0.443%	26719(1.00000)	200106(0.99557)	2.63699E+10(0.99556)
	TGZFOOL 1.263%	26719(1.00000)	197579(0.98737)	2.60359E+10(0.98733)
	PV_noBV 0.000%	26719(1.00000)	197579(1.00000)	2.60359E+10(1.00000)
	IPIFLG 2.086%	19321(0.72312)	138752(0.70226)	1.82823E+10(0.70220)
	KPI2BOXM 4.628%	17037(0.88179)	115928(0.83551)	1.52730E+10(0.83540)
	KP2STOP -0.086%	16972(0.99618)	115586(0.99705)	1.52279E+10(0.99705)
	RTOT40 0.000%	16972(1.00000)	115586(1.00000)	1.52279E+10(1.00000)
	$N_{K_{\pi 2}}$	16972	115586	1.52279E+10

Table 6: For the $K_{\pi 2}$, cuts applied in the $K_{\pi 2}$ BR analysis. Runs with prescalers 131072 and 163840 only !

$$\overline{Prescaler K_{\pi 2}} = \frac{9.34289E+10}{708068} \sim 131949$$

$$(KB_{live})_{K_{\pi 2}} = 1.448 \times 10^{12}$$

Cut name	Acc2002-Acc2007	$N_{K_{\pi 21}}$ (Acc) 2002	$N_{K_{\pi 21}}$ (Acc) 2007	$N_{K_{\pi 21}} \times Prescale$ (Acc) 2007
<i>SETUP</i> _{RD}	-28.511%	49651(0.61136)	395297(0.89647)	5.21481E+10(0.89647)
RD_TRK	0.000%	49651(1.00000)	395297(1.00000)	5.21481E+10(1.00000)
TRKTIM	0.000%	49651(1.00000)	395297(1.00000)	5.21481E+10(1.00000)
A_RD,Br	0.000%	1.00000 ± 0.00000	1.00000 ± 0.00000	1.00000 ± 0.00000
<i>SETUP</i> _{RECON}	-60.142%	32370(0.39858)	362383(1.00000)	4.78044E+10(1.00000)
RDUTM	0.000%	32370(1.00000)	362382(1.00000)	4.78043E+10(1.00000)
UTCQUAL	0.126%	29370(0.90732)	328339(0.90606)	4.33112E+10(0.90601)
TARGET+TGQUAL	4.094%	29063(0.98955)	311465(0.94861)	4.10852E+10(0.94861)
A_RECO,Br	3.835%	0.89784 ± 0.00168	0.85949 ± 0.00058	0.85944 ± 0.00000
<i>SETUP</i> _{REST}	-59.520%	32875(0.40480)	271241(1.00000)	3.57819E+10(1.00000)
TIC	-0.195%	32789(0.99738)	271059(0.99933)	3.57579E+10(0.99933)
TIMCON	-0.016%	32657(0.99597)	270011(0.99613)	3.56196E+10(0.99613)
TGTCON	1.171%	32657(1.00000)	266849(0.98829)	3.52002E+10(0.98823)
DCBIT	-0.216%	28892(0.88471)	236662(0.88688)	3.12263E+10(0.88711)
DELC	-0.455%	25149(0.87045)	207079(0.87500)	2.73147E+10(0.87473)
CKTRS	-0.052%	24469(0.97296)	201587(0.97348)	2.65905E+10(0.97349)
CKTAIL	-0.045%	23767(0.97131)	195895(0.97176)	2.58390E+10(0.97174)
B4DEDX	-0.122%	23357(0.98275)	192755(0.98397)	2.54243E+10(0.98395)
CPITRS	0.025%	23130(0.99028)	190834(0.99003)	2.51710E+10(0.99004)
CPITAIL	0.032%	23119(0.99952)	190682(0.99920)	2.51510E+10(0.99921)
TARGF	-0.170%	22120(0.95679)	182766(0.95849)	2.41074E+10(0.95851)
DTGTPP	-0.025%	22114(0.99973)	182762(0.99998)	2.41069E+10(0.99998)
RTDIF	0.051%	21917(0.99109)	181040(0.99058)	2.38798E+10(0.99058)
TGQUALT	0.000%	21917(1.00000)	181040(1.00000)	2.38798E+10(1.00000)
PIGAP	0.175%	21731(0.99151)	179186(0.98976)	2.36354E+10(0.98977)
TGB4	1.341%	20560(0.94611)	167127(0.93270)	2.20462E+10(0.93276)
KIC	0.603%	20409(0.99266)	164892(0.98663)	2.17516E+10(0.98664)
TGGEO	-0.666%	16788(0.82258)	136735(0.82924)	1.80376E+10(0.82925)
B4EKZ	4.113%	16240(0.96736)	126648(0.92623)	1.67076E+10(0.92627)
B4ETCON	0.426%	16240(1.00000)	126108(0.99574)	1.66361E+10(0.99572)
TGZFOOL	1.285%	16240(1.00000)	124488(0.98715)	1.64216E+10(0.98711)
BWTRS	-0.219%	15503(0.95462)	119111(0.95681)	1.57126E+10(0.95683)
RVUPV	0.349%	15278(0.98549)	116966(0.98199)	1.54291E+10(0.98196)
A_REST,Br	3.350%	0.46473 ± 0.00275	0.43123 ± 0.00095	0.43120 ± 0.00000
loose A_IPIFLG	1.100%	0.8350 ± 0.0054	0.82400 ± 0.00120	
tight A_IPIFLG	0.800%		0.82700 ± 0.00120	0.82700 ± 0.00120
A_{μ}^{acc}	0.000%	0.9931 ± 0.0002	0.9931 ± 0.0002	0.9931 ± 0.0002
is loss due to 19ct-bar				
tight IPIFLG A_{K_{π2},Br}	4.140%	0.3460 ± 0.0031	0.3046 ± 0.0035	0.3044 ± 0.0000

Table 7: $K_{\pi 2}$ -based acceptances of cuts applied in the $K_{\pi 2}$ BR analysis. The IPIFLG acceptance is measured using π_{scat} 's (counting method) similar to the $\pi\nu\bar{\nu}$ measurement of IPIFLG acceptance, except that here the π_{scat} 's are selected using KP2BOX and KP2STOP instead of BOX and LAYV4. The SETUP cuts are defined in Table 4. (similar to Table 69 on page 217 tn-k034). Runs with prescalers 131072 and 163840 only !

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